REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Official Action dated October 22, 2002 and the interviews with the Examiner dated January 23 and 27, 2003.

Claims 4-6, 8-13 are under consideration in this application. Claims 1, 3 and 7 are being cancelled without prejudice or disclaimer. Claims 4-6 and 8-10 are being amended, as set forth above and in the attached marked-up presentation of the claim amendments, in order to more particularly define and distinctly claim applicants' invention. Claims 11-13 are being added to recited other embodiment described in the specification. The paragraph [0033] has been amended for a typing error. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Formality Rejection

The disclosure and claim 5 were rejected for introducing the recitation of "radially-extended" in conjunction with the description of "the grooves are arrayed like spokes of a wheel" in the response. As indicated, the claims have been amended as discussed with the Examiner in the interviews on January 23 and 27, 2003. Accordingly, the withdrawal of the outstanding informality rejection is in order, and is therefore respectfully solicited.

Prior Art Rejections

Claims 1, 3, and 7 have been rejected under 35 U.S.C. § 102(b) as being anticipated by WO 98/20019 to Lough et al. (hereinafter "Lough"), and claim 6 was rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Pat. No. 6,347,259 to Goldenberg et al. (hereinafter "Goldenberg"). Claims 4-6 and 8-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lough, and claims 6 and 10 were rejected under 35 U.S.C. § 103(a) as being

unpatentable over Lough in view of Goldenberg. These rejections have been carefully considered, but are most respectfully traversed.

The spotting pin formed to spot a solution containing at least one reagent on a plate comprises: a solid member, wherein the solid member has at least one recess formed **only** at a head end thereof (Figs.6A-D; page 11, line 14; [0033]), said head end being formed to **carry** the reagent within the recess **to** the plate (page 9, line 20; [0031]), which the recess comprises at least one groove (claim 4) or one V-shaped notch (claim 6).

The invention, as now recited in claim 9, is directed to a spotting pin formed to spot a solution containing at least one reagent on a plate, wherein the solid member has a flat head end and at least one groove or V-shaped notch formed **only** at the head end, said head end being formed to **carry** the reagent therein **to** the plate.

First, Applicants respectfully contend that neither Lough nor Goldenberg, or their combination as relied upon by the Examiner, teaches or suggests such a solid spotting pin having a head end being formed to **carry** the reagent within the recess **to** the plate. In other words, the reagent solution or the probes are ***temporarily carried*** by the pin to be delivered to the plate for reaction in the plate.

In contrast, in the "pins" of the pin tools in Lough are holders rather than dispensers or transferring means as the pin of the present invention. The **holding** (rather than temporarily carrying) pins of Lough (Fig. 8) are ***fixed*** with the breads/probes, the nucleic acid ("immobilized" thereon), or PCR primers (page 18, line 16 to page 19, line 10) such that the breads/probes, etc. fixed thereon can be dipped into matrix solution or sprayed with the matrix solution with a microdrop device (page 20, lines 20-24). In other words, the holding pins do not dispense or spray the matrix solution but the microdrop device does. The breads/probes, etc. are so fixed on the holding pins that they have to be cleaved from the holding pins (page 20, line 25) with a sharp instrument so as to drop into a plate. As such, the basic structure, operation and overall concept disclosed by Lough are contradictory to the invention as a whole. It is well established that a rejection based on cited references having contradictory principles or principles that teach away from the invention is improper.

Goldenberg fails to compensate for Lough's deficiencies. Goldenberg's spotting pin 54 in Figs. 7-8 has the groove 62 extending form the top across the body to the tip/head end (rather than only at the head end as the invention) which functions as an elongated channel for holding

a solution ***beyond*** *the tip/head end.* On the other hand, the "groove" of the invention is "a long, narrow furrow or channel" in the recess ***only at*** *the head end.*

Second, the dispensing apparatus 10 in Goldenberg dispenses general liquid, such as ink, (not bio-probe or reagent solution). Goldenberg does not specify the liquid to be related to any bio-probes or reagents. There is no teaching of applying the dispensing apparatus to dispense bio-solution in Goldenberg. The Examiner's reliance upon the "common knowledge and common sense" of one skilled in the art for motivation to combine the teachings in Lough and Goldenberg does not fulfill the agency's obligation to cite references to support its conclusions. Instead, the Examiner must provide the specific teaching of allegations of "obviousness" or combination on the record to allow accountability.

> *To establish a prima facie case of obviousness, the Board must, inter alia, show "some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references." In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). "The motivation, suggestion or teaching may come explicitly from statements in the prior art, the knowledge of one of ordinary skill in the art, or, in some cases the nature of the problem to be solved." Kotzab, 217 F.3d at 1370, 55 USPQ2d at 1317. .... Recently, in In re Lee, 277 F.3d 1338, 61 USPQ2d 1430 (Fed. Cir. 2002), we held that the Board's reliance on "common knowledge and common sense" did not fulfill the agency's obligation to cite references to support its conclusions. Id. at 1344, 61 USPQ2d at 1434. Instead, the Board must document its reasoning on the record to allow accountability. Id. at 1345, 61 USPQ2d at 1435.*
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> See In re Thrift, 298 F.3d 1357.

Such an obligation to provide specific teaching(s) also applies to other existing or future obviousness rejections.

Even if, arguendo, a person of ordinary skill were motivated to combine the teachings in Lough and Goldenberg as specified by the Examiner, such combined teachings would still fall short in fully meeting the Applicants' claimed invention as set forth in claims 1 and 7 since, as

discussed, there are no teachings of "a solid spotting pin having a head end being formed to carry the reagent within the recess to the plate" in Lough or Goldenberg.

Applicants contend that Lough, Goldenberg, or their combination fail to teach or disclose each and every feature of the present invention as disclosed in independent claims 1 and 7. As such, the present invention as now claimed is distinguishable and thereby allowable over the rejections raised in the Office Action. The withdrawal of the outstanding prior art rejections is in order, and is respectfully solicited.

In view of all the above, clear and distinct differences as discussed exist between the present invention as now claimed and the prior art reference upon which the rejections in the Office Action rely, Applicants respectfully contend that the prior art references cannot anticipate the present invention or render the present invention obvious. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

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Marked-up Version of Amended Claims

4. [The] A spotting pin [of claim 1,] formed to spot a solution containing at least one reagent on a plate, which comprises a solid member, wherein the solid member has at least one recess formed only at a head end thereof, said head end being formed to carry the reagent within the recess to the plate, wherein the recess comprises at least one groove.

5. The spotting pin of claim [1]4, wherein the recess comprises a [radially-extended] cross-shaped groove.

6. [The] A spotting pin [of claim 1,] formed to spot a solution containing at least one reagent on a plate, which comprises a solid member, wherein the solid member has at least one recess formed only at a head end thereof, said head end being formed to carry the reagent within the recess to the plate, wherein the recess comprises at least one V-shaped notch.

8. The spotting pin of claim [1]4,wherein the [solid member comprises a] recess is shaped concave [tip] with a cross-shaped groove therein.

9. [The] A spotting pin [of claim 1,] formed to spot a solution containing at least one reagent on a plate, which comprises a solid member, wherein the solid member [comprises] has a flat [tip] head end [with a cross-shaped] and at least one groove or V-shaped notch formed only at the head end, said head end being formed to carry the reagent therein to the plate.

10. The spotting pin of claim 9, wherein the [recess] head end comprises two V-shaped notches crossing each other.

Marked-up Copy of Specification

concave tip. A pin **5b** shown in Figure **6B** has a concave tip with a cross-shaped groove. The concave shape of the tip of the pin **5b** allows the probe solution to be carried by surface tension by simply dipping the pin **5b** in the solution. The depth of the concave shape, or the depth of the recess in general, is optional. The amount of DNA carried with the pin **5a** or **5b** with the concave tip is about 10 times or more the amount carried with a conventional pin with a flat tip. A pin **5c** shown in Figure **5C** has a flat tip with a cross-shaped groove. The amount of DNA carried with this pin **5c** is also higher than that carried with the conventional flat tip. The pin can also have a V-shaped notch at the recessed tip. The pin **5d** shown in Figure **6D** has two V-shaped notches crossing at right angles at its cylindrical head end. With this pin **5d**, a greater amount of probe solution, binding agent, or mixture of probe and binding agent can be picked up and spotting accuracy may be enhanced. This pin **5d** also allows easy transferring of the probe solution from the tip of the pin **5d** onto a plate. The pin may also include a multitude of grooves and/or V-shaped notches (i.e., greater than 2) at the pin's head for enhancing accuracy for spot shape or solution amount control.

[0034] Figures **3A** to **3C** are diagrams for illustrating the principle of hybridization using the biochip **20** of the